„A climate just city requires an integrated urban and infrastructure planning“

Memorandum for research and implementation demand

The design of a climate just city requires an integrated urban development and infrastructure planning: to promote the evolution of urban and spatial frameworks towards increased robustness and resilience with respect to climate change, a comprehensive discussion is required to emphasize the handling of resources such as urban space, water and energy. However, this aspect has been insufficiently highlighted in the research and development programs so far.

The signatories identify the following challenges and opportunities in the development towards climate just cities:

1. Concerning the aspect of climate change, cities should be reevaluated. The **natural resources** comprising air, soil, water, green areas and landscape elements form the very basis for a climate just, sustainable city and should be adequately regarded in their climate adaptation. This applies in a similar way to the enhancement of their resilience, i.e. the buffering capacity of their important functions. Actions that are exclusively concerned with a greening of the city are in most cases not viable for achieving improved climate resilience, since soil, water and green areas are scarce goods.
2. Closely intertwined with the resulting measures for adaptation to the consequences of climate change are **social processes and dynamics**. Above all, social cohesion, dealing with the commons, conflict management and the city as a social community require specific sustainable urban and regional structures to be negotiated. The urban interaction with climate change can and should be coupled to the change of social conditions.
3. Currently, intensive work and discussion are taking place within the specific disciplines: the resulting **one-sided greening or economization of the city enables the optimization of individual sectors**. This is the case of e.g. urban rehabilitation, heritage preservation as well as energy-saving renovation, all of which are following independent development lines. This often leads to suboptimal results for the overall urban system.
4. The climate just city requires **integrated thinking to generate adaptive systems**. The social processes and dynamics must be tailored to the ecological foundations in order to achieve novel effects. Grey, green and blue infrastructure (technical lines and routes, urban green and water bodies) should no longer be regarded as independent; they can be linked and optimized together. In their synergy they will be able to fulfill multiple socioeconomic as well as ecological functions. This way both the resilience and the adaptability of the city towards changes can be enhanced. In this context, the distinction between different spatial and temporal scales is of importance.
5. In the urban planning practice, the **coupling of water, energy and nutrition** receives limited attention beyond international competitions and future visions in the context of “Green City”. Considering the city and the there existing (waste)water and energy re-

sources as an opportunity allows to actively determine where food is produced and consumed: which areas are supplied externally and where it is produced locally, or both combined. This requires both social negotiation processes for the planning and implementation as well as implementation research in order to develop, test and (where appropriate) implement long-term effective alternatives in larger areas.

6. Concerning the increase of operational costs, **dilapidated infrastructure** constitutes a growing cost factor and leads to a deterioration in performance as well as to higher follow-on costs due to breakdowns, disruptions, etc. Here it is reasonable not only to invest in the preservation of the functionality, but also to pursue transformation processes that enhance climate justice.
7. In many places there is still no consolidated balance that includes the infrastructure. There is **no transparent overview of the long-term total cost dynamics**. Therefore, it is not possible for the municipalities to adequately assess from an economic point of view the need for renewal and the transformation potential of their infrastructure. If the cities had a more comprehensive knowledge of their assets and maintenance costs, it would be possible to pursue targeted action and strategic investment management towards climate justice. Nowadays, investing in urban infrastructure in a coordinated manner not only implies finding an answer to climate protection, but also possibly achieving a long-term economic saving and generating profit.
8. **Climate resilience, quality of life and sustainability** of the city are closely related to the renewal and potential transformation of the infrastructure, if it comes to a clever interconnection between grey, green and blue infrastructure. The design potential is immense: for example, precipitations and adequately treated wastewater can, on the one hand, be used for green areas (parks, shading/cooling areas) and open water courses, for food production (such as urban gardening and farming) as well as for securing ecosystem services; on the other hand, they provide protection against repercussions of climate change (longer dry periods and heat waves, intensive precipitations and floods).
9. Cities and their neighborhoods undergo constant changes, which result in partly contradictory developments. Some neighborhoods, but also open spaces and landscape elements, contain innovation cores, the so-called "**Climate Improvement Islands**". Whoever structures his planned acting based on this model has in mind the city in its entirety but plans initially on a micro- or meso-level.
10. An **integrated urban planning that aims at an increased resilience and sustainability** should consider the entire urban region on different spatial and temporal scales: where and how should the single material, energetic and information flows be coupled; where and how to locate socially but also spatially; where and how should social negotiation processes be conducted? For such planning processes additional capacities in environmental planning and urban development are required on the municipal side.
    Therefore, in addition to the analytical and planning work, the involvement of stakeholders and residents of the city is relevant for the exchange and generation of improved knowledge, as well as for a transparent decision-making and negotiation process. The balance between the interests of the residents and the requests of investors is to be secured through the governance structure, e.g. urban development contracts. Urban labs that enable city planning through the interaction of multiple actors should be

systematically promoted to achieve comprehensive resilient urban spatial structures through system innovations.

11. In the climate just city, **aesthetics**, desire for the realization of one´s **lifestyle and quality of life** are associated with the transformation of the infrastructure. The city cannot be understood as an individual project, rather as a meeting point for different needs, perspectives and disciplines. The mutual exchange generates the transformation knowledge, which can pave the way towards the climate just city.
    Conflicts of interest regarding the use of remaining open spaces are particularly common in cities and urban regions affected by a strong population growth. While investors and decision-makers often vote for densification, the residents prioritize the preservation of green islands. A multi-functional cross-linking of the different areas can result in new spaces for thoughts and opportunities to integrate technical-functional and aesthetic solutions.

Based on these propositions we arrive at the following conclusion:

The climate just city is a major challenge for policy-makers and civil society. It can be designed future-proof, if the research and implementation needs are recognized in time. We propose that the different technical-scientific associations and the professional societies discuss together this pending problem. Enhanced resilience and adaptability can only be achieved through an integrated planning of climate justice, resources and energy. Water as a vital element and medium for transportation and design assumes a mediating role. Therefore, the subject of climate just cities should be widened synergistically in the central development programs, in research as well as in urban planning and housing.

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